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governing the warping planes, and at the other controlling the elevator. There is another controlling agent for the side rudders, and yet another for the fuel supply to the engine. The controlling mechanism is grouped in such a manner as to afford easy mastery over them, and Mr. Latham has shown that he can travel in the air without both hands being busily occupied.

The eight cylinders of the engine are grouped in two banks of four, arranged in V fashion; petrol is injected direct on to the inlet valves, no carburetter being employed. The fuel supply is governed by a pump of variable throw, and the necessary air is supplied through air pipes leading to the valves. The water-cooling arrangement on the Antoinette engine is also unique. Very little water is employed, and it is quickly turned into steam. This is carried away to an effective condenser, the tubes of which line the side of the main body. The condensed water is taken by a pump to the water tank, and thence is pumped to the cylinder jackets. This engine gives one horse power for about every three pounds of weight.—The London Times.

SCIENTIFIC BOOKS

Revision of the Mice of the American Genus Peromyscus. By WILFRED H. OSGOOD, Assistant, Biological Survey. Prepared under the direction of C. HART MERRIAM, Chief of Biological Survey, Department of Agriculture. North American Fauna, No. 28. Washington, Government Printing Office. April 17, 1909. Pp. 1-280, text-figs. 1-12, pl. I.-VIII.

Mammalogists have awaited with eagerness the long-delayed publication of Mr. Osgood's monograph of the genus *Peromyscus*. The work consists of a systematic study of all the members of the genus, and includes keys for the identification of the various forms, together with the necessary illustrations, and maps showing the geographical distribution of the species.

Plate I. (colored) illustrates the distribution of the species and subspecies of the *Peromyscus maniculatus* group, plates II. to VIII.

depicting the cranial and dental characters of prominent species of the genus, and text-figures 1 to 12 portraying the geographical distribution of the various species and groups.

As stated by the author:

The American genus *Peromyscus*, including the so-called wood mice, deer mice, vesper mice or white-footed mice, has needed revision for many years. One or more of its numerous species and subspecies inhabit almost every part of North America; moreover, these mice, wherever found, are among the most abundant of small mammals. The group, therefore, is of such importance that it must be dealt with in every work on North American mammals, whether pertaining to classification, geographic distribution or economic relations.

It is now about seven years since Mr. Osgood undertook the revision of this great genus of American murines, which has just been brought to a most satisfactory conclusion. During this time, in spite of many interruptions, he has examined all of the specimens of the genus *Peromyscus* in the great museums of America and in numerous private collections, in the British Museum, and the museums of Europe, having unearthed *Peromyscus* types in the museums of Munich and Zurich.

In 1891, Dr. J. A. Allen, after discussing certain species of *Peromyscus*, made the following statement:

But the time has not yet come for a satisfactory revision of the group, to attempt which at least 20,000 specimens are requisite, collected so as to fully represent the seasonal phases of pelage obtaining at hundreds of more or less widely separated localities.

Mr. Osgood remarks:

These conditions are now realized to the fullest degree, for the number of specimens examined in the present revision exceeds 27,000. The majority of these are contained in the extensive collection of the Biological Survey, which, under the direction of Dr. C. Hart Merriam, has been built up with special reference to the various life areas of North America, and without which no satisfactory study of this group would now be possible. . . . This material includes all the types, both of valid forms and of synonyms, known to be in existence.

In almost all cases in which no types exist, good series of topotypes, or specimens from near the type localities, have been available.

Mr. Osgood's study of this wealth of material has resulted in a definite expression of the characters of the species and geographic forms of *Peromyscus*, almost the last important genus of North American mammals which has remained to be systematized by a trained mammalogist in possession of an abundance of well-prepared and carefully-selected specimens.

The chaotic condition of *Peromyscus* can best be illustrated by a quotation from the author's introduction, under the caption of "History and Nomenclature":

In fact, no fewer than 167 names for new or supposed new forms of *Peromyscus* have been proposed since 1885. Add to this the 14 contained in the present paper, and the total of 181 is reached. . . . Of the 167 names [excluding those proposed by the author in the present monograph] for supposed new forms of *Peromyscus* proposed since 1885, 58, practically one third, are of more than doubtful status and are here treated as synonyms.

The subject matter is presented under the following headings: Introduction, Material, History and Nomenclature, Variation, Intergradation, Pelages, Color Descriptions, Measurements, Keys, Records of Specimens, Subgenera, Habits and Economic Status, List of Species and Subspecies with Type Localities, New Subspecies, Genus *Peromyscus*, Subgenus *Peromyscus*, Subgenus *Megadontomys*, Subgenus *Ochrotomys*, Subgenus *Podomys*, Subgenus *Haplomylomys*, Subgenus *Baiomys* and Table of Measurements.

The paper, throughout, has the advantage of being written in simple language adapted to the use of ordinary workers, to whom hints of practical value are being continually thrown out, the author happily having adopted the principle of helping rather than impressing his readers. There is also a pleasing element of fairness, and impartial weighing of evidence, when dealing with the writings of previous authors, which reflects the personality of the author.

The folded map (Plate I.) showing, in colors, the distribution and intergradation of the 39 subspecies of *Peromyscus maniculatus* must excite the astonishment and delight of mammalogists, inasmuch as showing that, at last, we have acquired enough specimens of one large and complex group to illustrate its interrelations. Many of the named forms which Mr. Osgood has placed in synonymy represent the wavy lines, which, in his colored diagram, show "areas of intergradation." Who, years ago, could have imagined that *Peromyscus canadensis* Miller (= *Peromyscus maniculatus gracilis*) and *Peromyscus pallidus* Allen could possibly be proved to be conspecific forms, actually intergrading through the subspecies *maniculatus*, *arcticus*, *nebrascensis*, *luteus* and *bairdi*? Again, in 1890, the reviewer described *arcticus* as a subspecies of *leucopus*, and, the same year, Merriam ventured to separate *rufinus* from *leucopus* as a subspecies. Now we know that these forms are distinct from the species *leucopus* and belong to the then unrecognized species *maniculatus*. This knowledge is due to the possession of adequate and carefully-studied material.

An important feature of Mr. Osgood's monograph is the wonderful key to *Peromyscus*, which is one of the best of its kind. With it, one can open the *Peromyscus* cage with the certainty that the particular white-stockinged little mouse wanted will prance out at the simple turn of the wrist. One can not fail to admire the ingenious construction of this key that actually works the combination.

As a reviewer, I suppose I ought, in self-defense, to find some fault with a monographer who has had the temerity to relegate several forms described by myself to the category of synonyms; but I have not the disposition to find fault with a work of such practical utility and completeness, planned on uniform lines, and carried out to such a satisfactory conclusion. It is really straining a point when, for instance, I assert that, in my opinion, *Peromyscus eremicus arenicola* should have been recognized as a valid subspecies of the Eastern

Desert Tract; and when I expostulate at having my *Peromyscus boylii penicillatus* compared with "a series from the Franklin Mountains near the type locality [of *penicillatus*]," which mountains lie wholly without the eastern desert differentiation tract, as defined in my mammals of the Mexican boundary line; also, *Peromyscus boylii pinalis* is, in my estimation, the Transition, zonal form of *P. b. rowleyi* of the Upper Sonoran Zone; but, on the whole, I am convinced that mammalogists will regard Mr. Osgood's conservatism, in the matter of recognizing subspecies, with favor. I am still of the opinion that Dr. True's subgenus *Baiomys* should be raised to the rank of a genus.

In conclusion, I take off my hat, and make a low bow to Mr. Osgood, as the author of one of the best papers dealing with North American mammals.

EDGAR A. MEARNES

The General Character of the Proteins. By S. B. SCHRYVER, Ph.D., D.Sc., Lecturer on Physiological Chemistry, University College, London. London, New York, Bombay and Calcutta, Longmans, Green and Co. 1909. Pp. x+86.

A review of progress in any field of study can serve a diversity of purposes. As a summary of discoveries made it brings an up-to-date appreciation of current knowledge and makes it ready for convenient reference; and if the résumé has been critically prepared, it may fulfill the almost equally important function of pointing out the limitations of our experience in any domain and the problems awaiting solution. In the latter respect especially, Dr. Schryver's monograph deserves commendation. The author has taken pains to emphasize how inadequate are the more familiar characterizations of the proteins and how imperfect the criteria of purity, individuality, etc., which are currently applied.

To those less familiar with the extensive literature on this subject it may come as a surprise to learn that the time-honored methods of isolation and identification of proteins employed in every biochemical laboratory

are at best extremely defective and unreliable. The investigator will find the refreshing suggestion that the contributions of modern colloid chemistry are far from adequate for an elucidation of the properties of the proteins; so that for some time to come, at any rate, "reliance will have to be placed chiefly on the purely chemical methods for the identification of the proteins."

The monograph is grouped into a review of: (1) The physical properties of the proteins, (2) their general chemical characters, and (3) a very brief reference to the biological methods of identifying proteins. It thus supplements Professor Aders Plimmer's earlier review of the chemical constitution of these compounds.

Among the diverse topics under discussion, that of the behavior of proteins towards acids and bases and the question of salt formation by them has, very properly, received a proportionately large share of attention from the author. This is most timely; for a more profound explanation of these phenomena will go far, we are confident, to explain many peculiarities of protein behavior. The limitation of cryoscopic methods applied to proteins in the present state of our knowledge of colloids is pointed out. The hope is expressed that some elaboration of quantitative reactions may be effected, so that the proteins may be characterized thereby. This is approached most nearly in the constants for the distribution of nitrogen in the molecule ("Hausmann numbers"). It is not unlikely that a tyrosine factor (Millar), or an amino-index (Brown, Sørensen) may give us useful data comparable, as Dr. Schryver suggests, with the constants employed in fat analysis.

In the discussion of the "salting out" of proteins the early work of Dénis is given a recognition which most writers overlook. The expression "prosthetic group" usually ascribed to Kossel is attributed to Hoppe Seyler (pp. 3 and 32). In the discussion of methods of crystallizing egg albumin, the experience of T. B. Osborne¹ and other investigators is overlooked. A similar comment

¹*Jour. Amer. Chem. Soc.*, 1899, XXI.